

ABSTRACTAtom Transfer Polymerisation

5 A first aspect of the invention provides a catalyst for addition polymerisation of olefinically unsaturated monomers comprising:

- a) A first compound

MY

10 where: M is a transition metal in a low valency state or a transition metal in a low valency state co-ordinated to at least one co-ordinating non-charged ligand

Y is a monovalent, divalent or polyvalent counterion;

15 b) An initiator compound comprising a homolytically breakable bond with a halogen atom; and

c) An organodiimine, where at least one of the nitrogens of the diimine is not part of an aromatic ring;

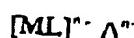
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A second aspect of the invention provides a catalyst for addition

polymerisation of olefinically unsaturated monomers comprising:

- d) A first component of Formula**

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where: M = a transition metal of low valency state

L = an organodiiimine where at least one of the nitrogens of the diimine is not part of an aromatic ring

A = an anion

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n = an integer of 1 to 3

m = an integer of 1 or 2;

- c) An initiator compound comprising a homolytically breakable bond with a halogen atom.**

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Preferably, the organodiimine is a 1,4-diaza-1,3-butadiene, a pyridine carbaldehyde imine, an oxazolidone or a quinoline carbaldehyde.

Processes for using the catalysts are also disclosed.

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